

In re WILLIAMS ET AL., Application No. 09/752,422  
Amendment A

**Amendments to the Claims:**

The listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claims 1-20 (canceled)

Claim 21 (original): A method for routing a plurality of packets between a first source of a plurality of sources and a first destination of a plurality of destinations in a packet switching system, the method comprising:

each of the plurality of sources maintaining at least one source state indication;

each of the plurality of destinations maintaining at least one destination state indication;

the first source sending a first set of packets of the plurality of packets to the first destination, each packet of the first set of packets including a first state indication reflected in one of the at least one source state indications maintained in the first source;

after sending the first set of packets, the first source sending a source barrier message over each of a plurality of paths leading to the first destination through the packet switching system;

in response to receiving a destination barrier message generated in response to said sent plurality of source barrier messages, the first destination recognizing a barrier transition or a new barrier state and updating one of the at least one destination state indication; and

the destination manipulating at least one packet of the first set of packets in response to the barrier transition or the new barrier state.

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Claim 22 (currently amended): The method of ~~claim 22, further~~ claim 21, comprising:  
each of the plurality of destinations relaying a barrier state indication of a barrier  
transition or the new barrier state to at least one of the plurality of sources;

in response to receiving a first predetermined number of barrier state indications, each  
of the at least one of the plurality of sources sending a source barrier acknowledgement  
message over each of a plurality of paths leading from the at least one of the plurality of  
sources;

after receiving a second predetermined number of destination acknowledgement  
messages, each of the plurality of destinations relaying a barrier acknowledgement indication  
to the at least one of the plurality of sources; and

in response to receiving the first predetermined number of barrier acknowledgement  
indications, each of the at least one of the plurality of sources updating at least one of said at  
least one source state indication.

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Claim 23 (currently amended): A method performed by a switching element of a packet switching system, the method comprising:

maintaining a plurality of output queues for containing packets to be sent over a plurality of outgoing links to a plurality of other components of the packet switching system  
maintaining a barrier state;  
updating the barrier state in response to receiving a barrier state transition request on each of a plurality of incoming links; and  
~~placing a packet containing the barrier state transition request in at least each of the output queues that are occupied by at least one packet; and~~  
sending packets over the plurality of outgoing links to the plurality of other components of the packet switching system.

Claim 24 (currently amended): The method of claim 23, wherein said sending packets includes sending a packet containing the barrier state transition request out each of the outgoing plurality of links.

Claim 25 (currently amended): The method of claim 23, ~~further~~ comprising placing a packet containing the barrier state transition request in at least each of the output queues that are occupied by at least one packet.

Claim 26 (currently amended): The method of claim 23, ~~further~~ comprising sending an outgoing barrier acknowledgement message out each of the outgoing plurality of links in response to receiving an incoming barrier acknowledgement message over said each of a plurality of incoming links.

Claims 27-29 (canceled)

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Claim 30 (original): A packet switching system comprising:

a plurality of source elements, each of the plurality of source elements including: a source barrier state maintainer to indicate a current source state; a barrier accumulator to receive indications of a first subset of a plurality of barrier request and acknowledgement messages, to determine when a particular barrier request or acknowledgement message may be sent, and to update the current source state;

a plurality of switching nodes, each of the plurality of switching nodes including: a switching node barrier state maintainer to indicate a current node state; a switching node barrier accumulator to receive indications of a second subset of the plurality of barrier request and acknowledgement messages, to determine when a second particular barrier request or acknowledgement message may be forwarded to a next switching node or destination element, and to update the current node state; and

a plurality of destination elements; each of the plurality of destination elements including: a destination barrier state maintainer to indicate a current destination state; a destination barrier accumulator to receive a third subset of the plurality of barrier request and acknowledgement messages, to determine when a particular barrier request or acknowledgement message may be relayed to at least one of the plurality of source elements, and to update the current destination state; and a packet sending mechanism to determine when a particular packet associated with a particular state may be manipulated or sent from the particular destination element based on the current or a previous destination state.

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Claim 31 (new): One or more computer-readable media containing computer-executable instructions for performing steps by a switching element of a packet switching system, said steps comprising:

- maintaining a plurality of output queues for containing packets to be sent over a plurality of outgoing links to a plurality of other components of the packet switching system
- maintaining a barrier state;
- updating the barrier state in response to receiving a barrier state transition request on each of a plurality of incoming links; and
- sending packets over the plurality of outgoing links to the plurality of other components of the packet switching system.

Claim 32 (new): The computer-readable media of claim 31, wherein said sending packets includes sending a packet containing the barrier state transition request out each of the outgoing plurality of links.

Claim 33 (new): The computer-readable media of claim 31, wherein said steps comprise: placing a packet containing the barrier state transition request in at least each of the output queues that are occupied by at least one packet.

Claim 34 (new): The computer-readable media of claim 31, wherein said steps comprise: sending an outgoing barrier acknowledgement message out each of the outgoing plurality of links in response to receiving an incoming barrier acknowledgement message over said each of a plurality of incoming links.

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Claim 35 (new): A switching element of a packet switching system, the switching element comprising:

means for maintaining a plurality of output queues for containing packets to be sent over a plurality of outgoing links to a plurality of other components of the packet switching system

means for maintaining a barrier state;

means for updating the barrier state in response to receiving a barrier state transition request on each of a plurality of incoming links; and

means for sending packets over the plurality of outgoing links to the plurality of other components of the packet switching system.

Claim 36 (new): The switching element of claim 35, wherein said means for sending packets includes means for sending a packet containing the barrier state transition request out each of the outgoing plurality of links.

Claim 37 (new): The switching element of claim 35, comprising means for placing a packet containing the barrier state transition request in at least each of the output queues that are occupied by at least one packet.

Claim 38 (new): The switching element of claim 35, comprising means for sending an outgoing barrier acknowledgement message out each of the outgoing plurality of links in response to receiving an incoming barrier acknowledgement message over said each of a plurality of incoming links.